Small Business Innovation Research/Small Business Tech Transfer

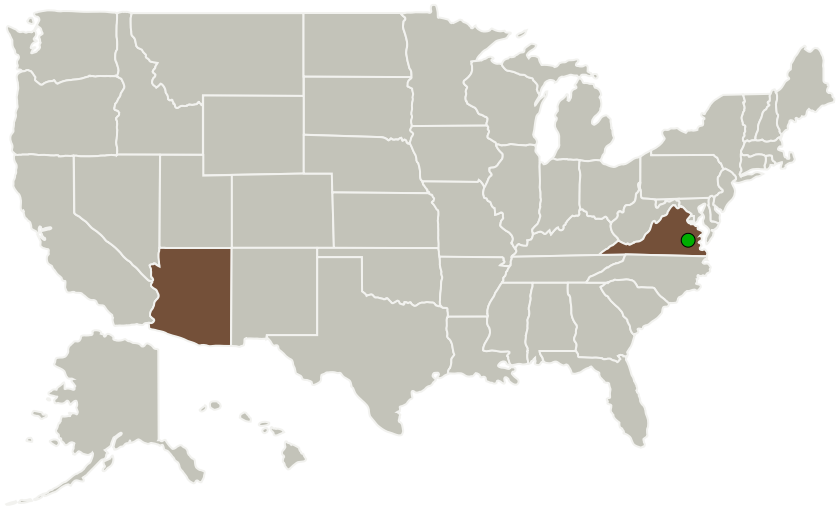
Radiation-Hardened 1.55 Micron Fiber Laser for Coherent LIDAR, Phase I

Completed Technology Project (2015 - 2015)

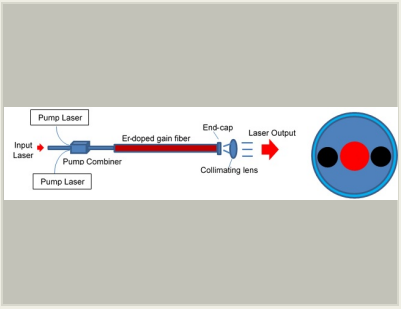
Project Introduction

In this proposal, we propose to demonstrate and build high pulse energy near 1.55 micron wavelength single frequency fiber laser by developing an innovative polarization maintaining Er-doped gain fiber with extremely large mode field diameter. Such a single frequency high energy and high peak power fiber laser is needed for coherent lidar and sensing. We will enhance the radiation resistance of the gain fiber in order to make it suitable for NASA's applications. In Phase I, we will design and fabricate Er-doped glasses, fiber preforms, and fibers. High pulse energy will be demonstrated. This proposed system will be all-fiber based, which offers excellent reliability. Successful demonstration of such a fiber laser can enable many new NASA and commercial applications.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
AdValue Photonics, Inc.	Lead Organization	Industry Small Disadvantaged Business (SDB)	Tucson, Arizona
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia



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Primary U.S. Work Locations	
Arizona	Virginia

Project Transitions

June 2015: Project Start

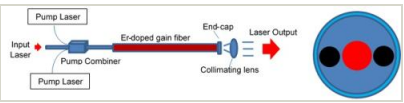
December 2015: Closed out

Closeout Summary: Radiation-Hardened 1.55 Micron Fiber Laser for Coherent LIDAR, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/139378)*

Images



Briefing Chart Image
Radiation-Hardened 1.55 Micron Fiber Laser for Coherent LIDAR, Phase I
(https://techport.nasa.gov/image/131382)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
AdValue Photonics, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

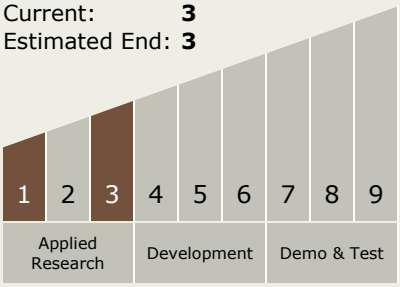
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Shibin S Jiang

Technology Maturity (TRL)

Start: **1**
Current: **3**
Estimated End: **3**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.3 In-Situ Instruments and Sensors
    - TX08.3.4 Environment Sensors

Target Destinations

Earth, The Moon, Others Inside the Solar System, Outside the Solar System, The Sun, Mars